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A novel approach to monitoring and controlling biofilms in an ethanol cooling system resulting in maximized ethanol production and minimized corrosion failures of piping and heat exchangers

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Ethanol plants rely on cooling towers to regulate temperatures in various parts of the process in order to run efficiently and productively. This cooling is so critical to ethanol production that some plants use chillers during the summer months to provide additional cooling in order to maintain production levels. In 2017 Solenis introduced North American ethanol producers to the hidden threat of biofilm in these cooling water systems. The issue is that while operators have clean-in-place procedures to address the process side fouling of critical heat exchangers, the cooling tower water side of these heat exchangers often gets less if any attention. Additionally, water reuse demands limit treatment options in cooling systems. As a result, biofilms, a thin coating of bacteria including their secretions and any entrained solids in the water, can form on the cooling water side of these exchanges and impede heat transfer. Lastly, these films are highly corrosive to the underlying metallurgy, resulting in leaks and failures in mere years when the equipment should be expected to last for decades. While awareness continues to grow, this paper will build on the knowledge shared in 2017, and reinforce the importance of controlling biofilm by providing followup performance data on a novel treatment program called ClearPoint. Data from one ethanol producer which has been using this program for over a year now will be shared. Two technologies, new to the ethanol industry, one being a real-time biofilm monitoring device, and the other being an alternative microbiocide to chlorine, are at the heart of this program. We will share how this approach has helped this ethanol producer to reduce chiller usage by over 80% during the summer of 2017 (as part of a new larger cooling tower installation), in addition to a greater than tenfold reduction in mild steel and copper corrosion in their cooling system. This improvement has maximized the asset life of their system and saved significantly on energy while minimizing costs and downtime associated with repairing leaks.

Biography

Andrew Ledlie is the North American Marketing Manager for Biorefining at Solenis. He has 27 years of experience in a variety of roles and industries for Water and Process treatment at Solenis and is currently responsible for strategic planning and development and launch of new technologies into the ethanol market. He is a frequent speaker at ethanol conferences and author of numerous articles in Ethanol Producer Magazine and Biofuels International Journal. A graduate in Molecular Biology at McMaster Universtiy, he resides in Hamilton, Ontario.

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